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A new deep-water species of *Myopiarolis* Bruce, 2009 (Crustacea: Isopoda: Serolidae) from New Zealand waters

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Abstract

Myopiarolis tona **sp. nov.** is described from the Challenger Plateau, southern Lord Howe Rise and the west coast of the North Island, New Zealand at depths of 634–1250 m. *M. tona* **sp. nov.** can be identified by the prominent posteriorly directed dorsal nodule on fused pereonites 5–7. There are nine species in four genera of the cold-water, epibenthic family Serolidae recorded from New Zealand waters, three species of *Myopiarolis* Bruce, 2009, one undescribed species of *Acutiserolis* Brandt, 1988, four of *Brucerolis* Poore and Storey, 2009 and the monotypic *Spinoserolis* Brandt, 1988.

Key words: *Myopiarolis*, taxonomy, new species

Introduction

The Serolidae are a relatively small and primarily Southern Hemisphere family of 23 genera and 123 species (Schotte *et al*. 2015), nine of which occur in New Zealand. Serolids range in size from a few millimetres to the large sub-Antarctic *Ceratoserolis* Cals, 1977 that reaches to more than 5 cm in length. Two species are subtidal, with most species occurring from the shallow subtidal down to depths of 2000 m. The greatest recorded depth for the family is of *Atlantoserolis vemae* (Menzies, 1962) at a depth of 5024 m.

The family has been reviewed extensively by Brandt (1988) and Wägele (1994); references to earlier works can be found in those titles. Phylogeny, biogeography and cryptic speciation of the family has been analysed albeit with relatively small datasets (Held 2000, 2001, 2003; Leese and Held 2008; Leese et al. 2008a, 2008b, 2010). The taxonomy of the New Zealand Serolidae has most recently been updated by Bruce (2008), Poore and Storey (2009) and Storey and Poore (2009). Bruce (2009) reviewed the genus *Myopiarolis* for the southwestern Pacific and gave a key to the serolid genera of the tropical and subtropical Indo-Pacific, which can be used to identify the New Zealand genera. At present the New Zealand Serolidae are represented by nine species in four genera, namely *Myopiarolis* Bruce, 2009 (three species), one of *Acutiserolis* Brandt, 1988, four of *Brucerolis* Poore and Storey, 2009 and the monotypic *Spinoserolis* Brandt, 1988. *Myopiarolis* is a widespread genus with greatest diversity in the southwestern Pacific, as previewed by Bruce (2009). The highest species diversity is in New Zealand waters, three described species (*M. bicolor* (Bruce, 2008)*, M. carinata* (Bruce, 2008) and *M. tona* sp. nov.) and a further five undescribed species from New Zealand waters have been determined from material held in the NIWA collections.

Material and methods

The description is based on the male holotype and female allotype. Dissected appendages of male paratype were removed from the left hand side unless the appendage was damaged. Specimens were examined, dissected and

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drawn using a *camera lucida*. Pencil drawings were scanned, digitally inked and arranged as plates using the methods described by Coleman (2003, 2009).

The body lengths of specimens were measured by tracing the mid-trunk length from the tip of the rostrum to the end of the pleotelson. Appendage length was measured using the software programme Adobe Illustrator along the mid line and the width transverse to this line, maximum lengths used. Allowance for variation should be used when interpreting the ratios and numbers of setae. The drawings made of one dissected male paratype were used for numbers of setae and ratio measurements. Therefore no range of variation is given. Accuracy of ratios are to one decimal figure. Drawings of pereopods 4, 5 and 6 have been omitted as they are similar to pereopods 3 and 7, forming a morphological continuum.

The species description was prepared from Serolidae character sets using the program DELTA, (Coleman *et al.* 2010; Dallwitz *et al.* 2014).

All material is in the NIWA Invertebrate Collection, NIWA, Greta Point, Wellington.

Abbreviations: NIWA—National Institute of Water and Atmospheric Research Ltd., Wellington, New Zealand; PMS—plumose marginal setae; RS—robust setae.

Taxonomy

Serolidae Dana, 1852

Myopiarolis Bruce, 2009

Myopiarolis Bruce, 2009: 38.
Caecoserolis—Poore and Brandt, 1997: 161 (part).

Type species: *Myopiarolis systir* Bruce, 2009; by original designation.

Remarks. The genus can be identified by the following combination of characters: small lenticular eyes (<5% head width) when present, coxae 2–4 distally truncate forming continuous body outline, broad but posteriorly produced coxa 6 that extend laterally along the pleotelson, pleonites 2 and 3 that curve posteriorly and run along the side of the pleotelson, but are laterally overlapped by coxa 6, antenna with slender peduncle articles 4 and 5 (4.6–6.3 and 8.6–10.3 times as long as wide, respectively). Compared to other serolid genera the uropods are short (<0.3 pleotelson), inserted ventrally about halfway along the pleotelson lateral margins, and the rami are consistently bluntly rounded. Females are similar to males, differing only in somatic ornamentation. Bruce (2009) listed the then known species of the genus together with a key to these species.

Myopiarolis tona sp. nov.
(Figures 1–4)

Material examined. *Holotype*: ♂ (8.0 mm), Challenger Plateau, off the West coast, South Island, New Zealand, 40.83ºS, 168.24ºE, 17 April 1980, depth 1009 m, stn P927 (NIWA 99811).

Paratypes: 2 ♂ (8.5 [dissected and drawn], 8.0 mm). 2 ♀ (ovig. 10 [dissected allotype], 8.5 mm), same data as holotype (NIWA 32396). 1 ♀ (non-ovigerous 9.0 mm), North West Slope, off West coast, North Island, New Zealand, 38ºS, 173.31ºE, 14 March 1968, depth 1247–1250 m, stn E90–TAM (NIWA 32414).

Other material: 1 ♂ (7.7 mm), South Lord Howe Rise, 36.92067ºS, 167.5268ºE, 30 May 2007, depth 1216 m, stn TAN0707/52 (NIWA 31571). 1 ♂ (7.5 mm), Challenger Plateau, 39.54367ºS, 169.7145ºE, 4 June 2007, depth 634 m, stn TAN0707/93 (NIWA 31574).

Description of male. *Body* 1.3 times as long as wide, widest at pereonite 2, dorsal surfaces sparsely punctate. *Head* anterolateral lobes weakly convex; dorsally without tubercles, posterior margin with low rounded median tubercle and pair of low lateral tubercles. *Eye* minute (less than 5% greatest width of head), elliptical (lenticular/ovoid), ommatidia not distinct. *Pereonites,* pereonite 1 anterolateral margin continuously convex; dorsal surfaces with medial posterially directed prominent blunt tubercle on fused pereonites 5–7; small median tubercles on pereonites 2–4, and pleonite 1 and 2; posterolateral margins of pereonite 1 with row of small tubercules; pereonites

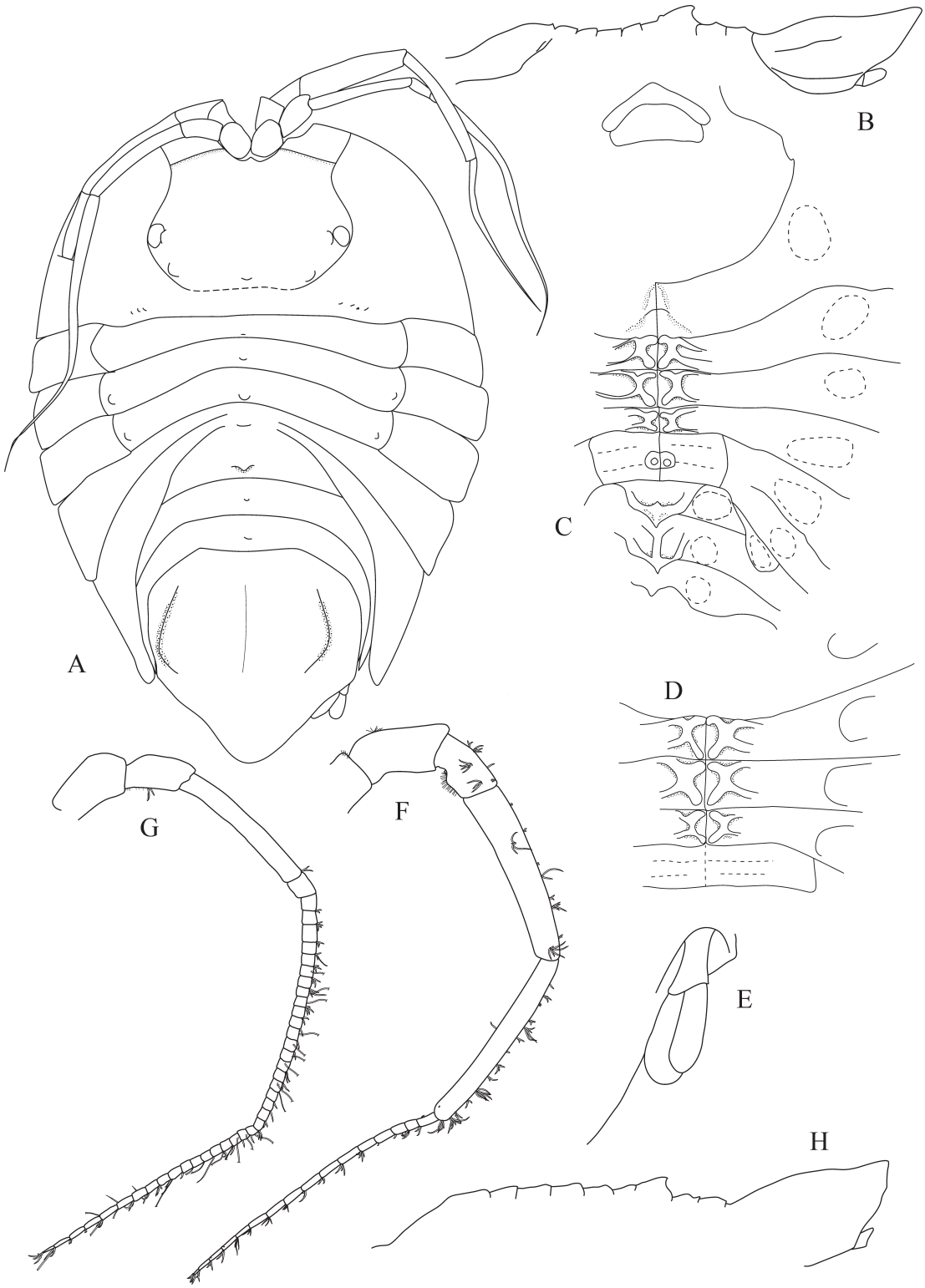

FIGURE 1. *Myopiarolis tona* **sp. nov**., holotype (male, 8.0 mm): A, dorsal view. B, lateral view. Paratype (male, 8.5 mm): C, ventral view of head, pereonites, and pleonites (damaged area in grey). Female paratype (8.5 mm): D, ventral coxal plates, sternites and left oostegites. Male Paratype (8.5 mm): E, uropods (ventral view). F, antenna. G, antennula. Paratype (female, 10.0 mm): H, lateral view.

3 and 4 with single small tubercule at posterodistal corner. *Coxae*, distal margins weakly convex; coxa 4 not posteriorly extended; coxa 5 extending posteriorly along 0.3 of pleotelson length; coxa 6 extending to insertion of uropod, and along 0.8 of pleotelson length. *Ventral coxal plate*s 2–4 meeting midline, mesially elevated, plates 2–4 mesially with ridges forming X-shape, 5 and 6 incompletely separate, 7 separate; sternites 5–7 visible, fused.

Pleonites extending posteriorly along 0.8 of pleotelson lateral margin; pleonite 1 sternal plate with weak median ridge. *Pleotelson* 1.0 times as long as anterior width; dorsal surface with low median longitudinal carina; lateral carinae entirely carinate, pleotelson lateral margins convex, posterior margin converging to rounded caudomedial point, without distinct median excision.

Antennula peduncle article 2 1.8 times as long as wide; articles 3 and 4 2.6 times as long as article 2; article 3 7.8 times as long as wide; flagellum 2.8 times as long as peduncle articles 3 and 4, with 39 articles, extending to pereonite 4. *Antenna* peduncle article 4 5.8 times as long as wide, 2.9 times as long as article 3; article 5 1.1 times as long as article 4, 9 times as long as wide; antennal flagellum 1.5 times as long as peduncle article 5, with 16 articles, extending to posterior of pereonite 3 or posterior of pereonite 4.

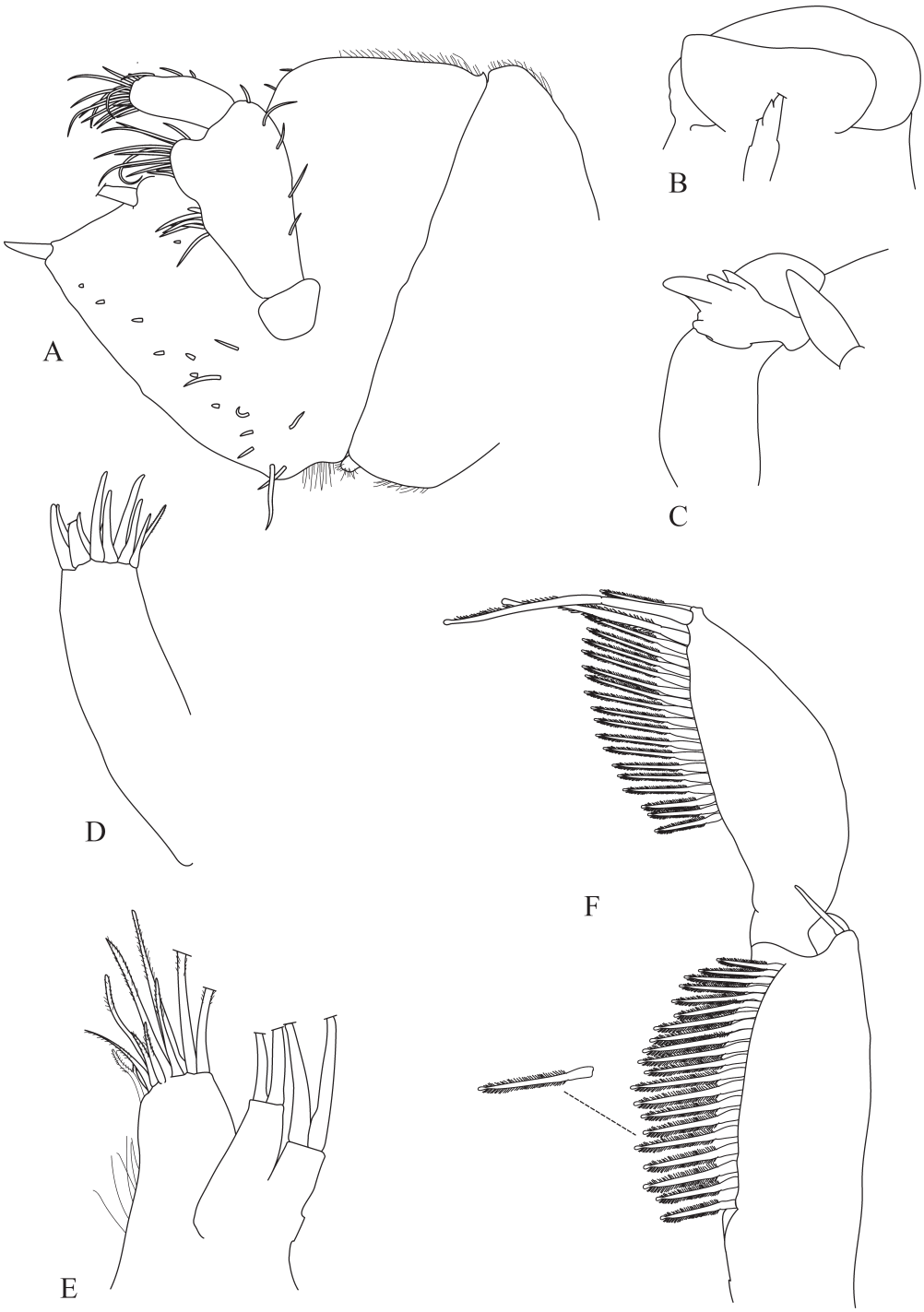

FIGURE 2. *Myopiarolis tona* **sp. nov**., male paratype (8.5 mm). A, maxilliped. B, left mandible, distal margin. C, right mandible, distal margin. D, maxillula. E, maxilla. F, mandible palp and detail of setae.

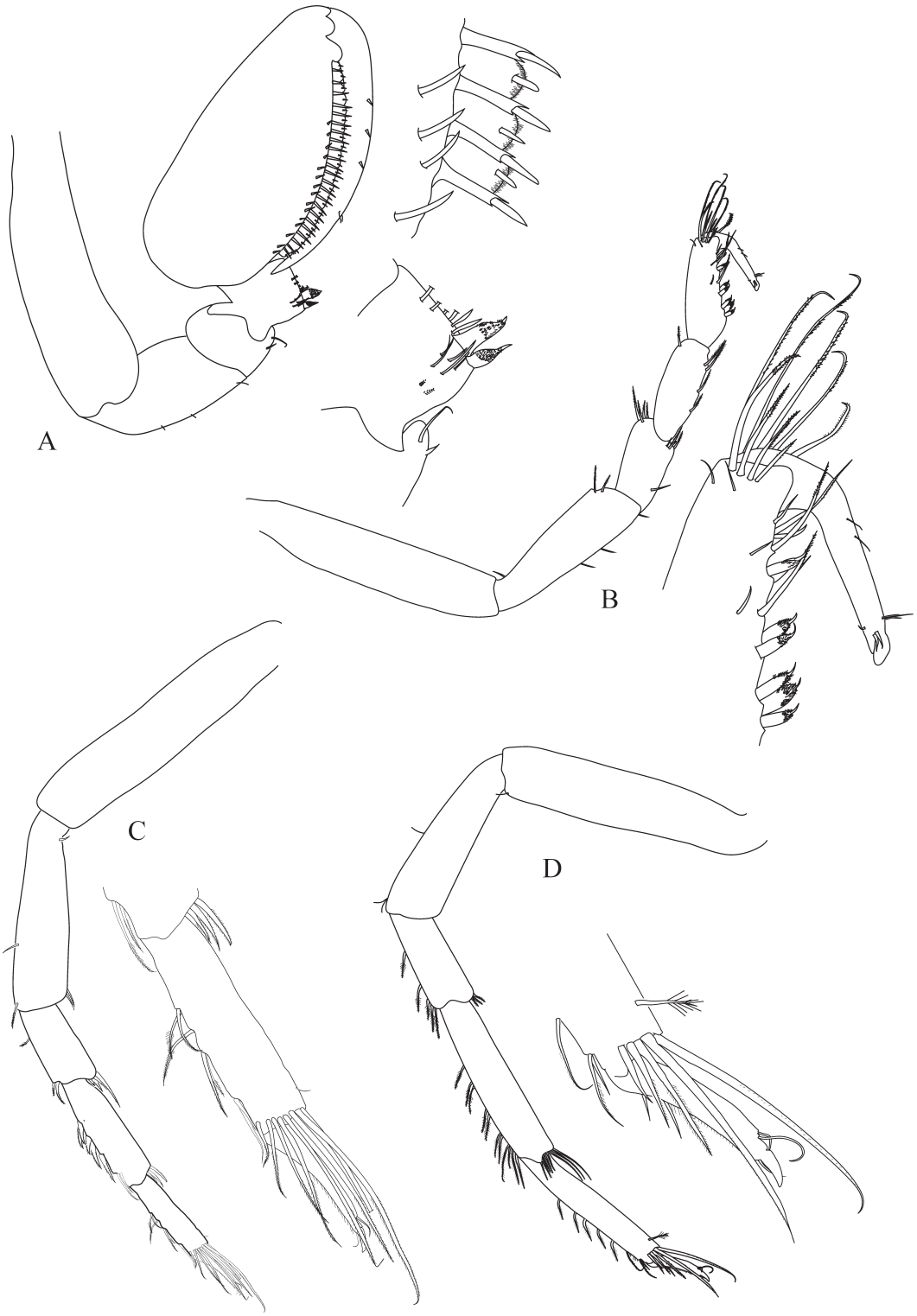

FIGURE 3. *Myopiarolis tona* **sp. nov**., male paratype (8.5 mm). A, pereopod 1, with details of palm setae and carpus. B, pereopod 2 with detail of propodus and carpus. C, pereopod 3 and detail of tip. D, pereopod 7 and detail of tip.

Epistome with obtuse median point and median ventral projection. *Mandible incisor* even, without cusps. *Left mandible lacinia mobilis* 0.8 times as wide as incisor; palp article 2 with 20 distolateral biserrate setae, article 3 with 21 distolateral biserrate setae. *Maxilla* mesial lobe with 11 long, finely serrate setae; middle lobe with 2 long simple setae (terminal); lateral lobe with 2 distal simple setae. *Maxilliped palp* article 2 proximomesial margin with 6 setae, distomesial margin with 9 setae, lateral margin distally with 5 setae (continuously along margin); article 3 lateral margin with 3 setae, distal margin with 13 setae; endite distal margin RS simple.

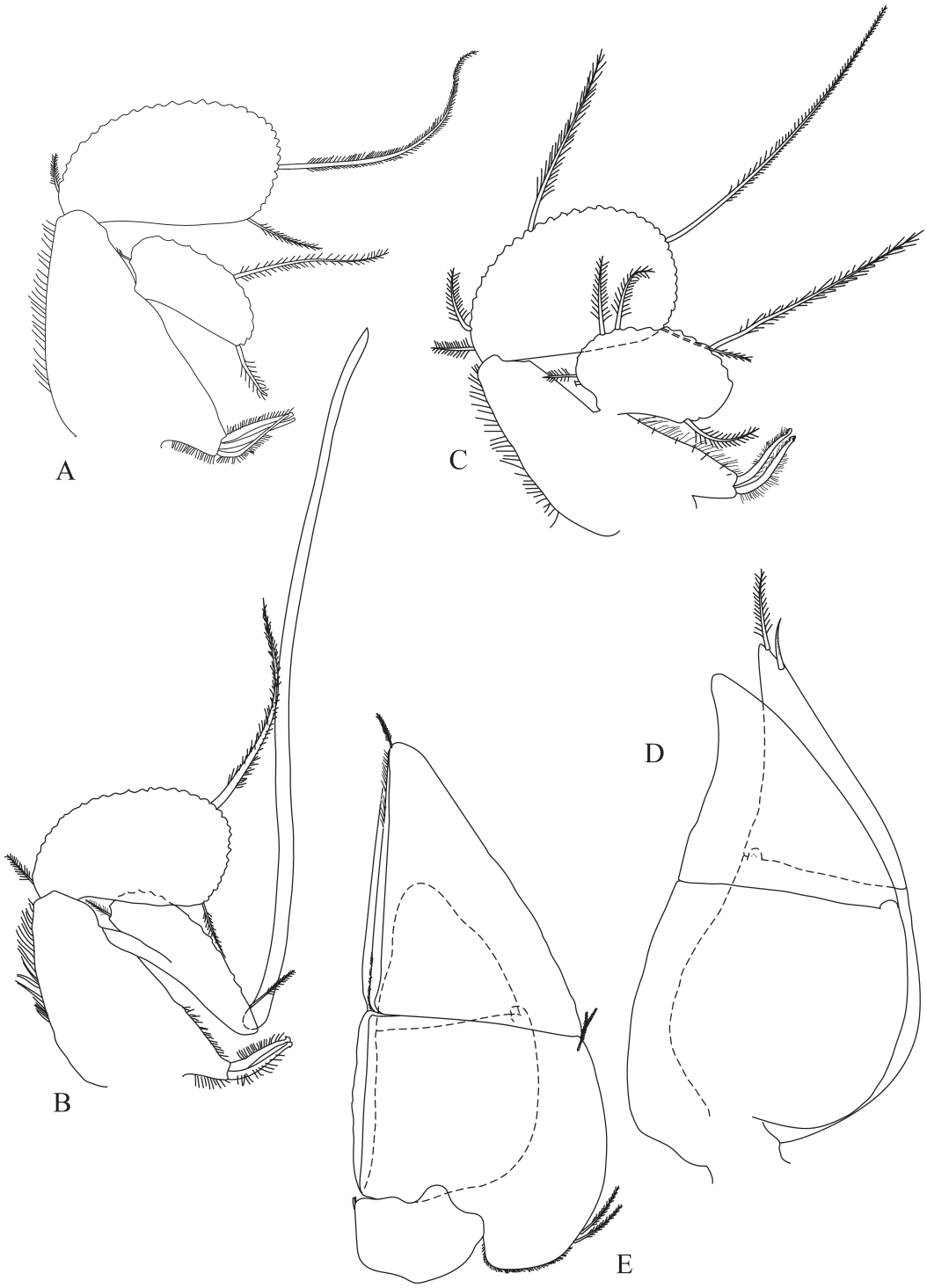

FIGURE 4. *Myopiarolis tona* **sp. nov**., male paratype (8.5 mm). A–C, D and E, pleopods 1–5, respectively.

Pereopod 1 propodus 2.2 times as long as wide, inferior margin with 48 robust setae; 24 wide RS finely pilose, 24 narrow RS distally bifid, with simple flagellum; dactylus with acute unguis. *Pereopod 2* basis 4.8 times as long as greatest width; ischium 0.6 times as long as basis, ischium 3.1 times as long as wide; merus 0.5 times as long as ischium, merus 1.8 times as long as greatest width, inferior margin with 1 distal cluster of 4 setae , superior distal angle with 4 setae; carpus 0.6 times as long as ischium, 2.6 times as long as wide, inferior margin with 3 clusters of setae; propodus 0.6 times as long as ischium, 2.5 times as long as wide, inferior margin with distinct heel, palm weakly concave, inferolateral margin with 4 RS, inferomesial margin with 3 RS, inferior margin RS distally bifid, distally pilose, distal margin with 10 setae; dactylus 0.8 times as long as propodus, unguis blunt, with prominent

secondary unguis. *Pereopod 6* basis 4 times as long as greatest width; ischium 0.7 times as long as basis, ischium 3.5 times as long as wide, inferior margin with 1 cluster of setae, superior distal angle with 2 RS; merus 0.5 times as long as ischium, 2.2 times as long as wide, inferior margin with 4 clusters of setae, superior distal angle with 2 setae; carpus 0.8 times as long as ischium, 4.5 times as long as wide, inferior margin with 7 clusters of setae, superior distal angle with 7 setae; propodus 0.8 times as long as ischium, 7.6 times as long as wide, inferior margin with 7 clusters of setae, distal margin with 9 setae, inferior distal angle with 1 RS; dactylus 8 times as long as proximal width. *Pereopod 7* similar to, but 0.8 times as long as pereopod 6. Setae on inferior margins of pereopods 4–7 finely plumose. Inferior margins of pereopods 2–7 setulose fringe weakly developed.

Penial openings adjacent, penes opening flush with surface of sternite 7.

Pleopod 1 peduncle 1.9 times as long as wide, mesial margin with 3 coupling setae; exopod 1.7 times as long as wide, with 34 PMS; endopod 2.6 times as long as wide, 0.6 times as long as exopod, with 18 PMS. *Pleopod 2* peduncle 1.2 times as long as wide, mesial margin with 2 coupling setae; exopod 1.7 times as long as wide, with 36 PMS; endopod 2.8 times as long as greatest width, lamellar part 3.1 times as long as wide, with 15 PMS; appendix masculina 4.1 times as long as endopod. *Pleopod 3* exopod with 37 PMS, endopod with 23 PMS. *Pleopod 4* exopod with complete transverse suture, endopod with complete transverse suture. *Pleopod 5* exopod with complete transverse suture, endopod with complete transverse suture.

Uropods (rami + peduncle) 0.3 times as long as pleotelson, peduncle 0.8 times as long as endopod. *Endopod* 2.1 times as long as wide; distally broadly rounded. *Exopod* as long as endopod, 3 times as long as wide, distally broadly rounded.

Female. Similar to the male; ridges on ventral coxal plate 4 less raised than in males, no ridges on 5. Pereopods 1 and 2 similar to male pereopod 3. No sexual dimorphism of pereopod 7 or pleopod 3.

Size. Length: Males 7.5–8.5 mm (n= 5); females 9.0–10.0 mm (n=3).

Variation. The large triangular median nodule on fused pereonites 5-7 is always prominent, but varies in height and shape, with some being more 'hooked' than others.

Remarks. *Myopiarolis tona* **sp. nov.** can best be recognized by the head posterior margin with low rounded median tubercle and pair of lateral tubercles, small, low median tubercles present on pereonites 2–4 and 6, the large triangular median nodule on fused pereonites 5–7, and the coxae of pereonite 6 extend posteriorly to the insertion of the uropods. *Myopiarolis tona* **sp. nov.** is the only species of the genus with this 'fin-shaped' nodule. *Myopiarolis tona* is similar to *M. koro* Bruce, 2009, *M. lippa* Bruce, 2009, and *M. novacaledoniae* (Poore and Brandt, 1997) in outline and pleotelson features, while the nodules on the posterior margin of the head are similar to *M. norfanz* Bruce, 2009. In profile *M. tona* **sp. nov.** is most similar to *M. carinata*.

Distribution. Off western New Zealand: South Lord Howe Rise (634 m), Challenger Plateau (1009–1216 m) and off northwestern New Plymouth (1248 m).

Etymology. From the Maori word for nodule, referring to the prominent, posterior facing nodule on fused pereonites 5–7; noun in apposition.

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